Different Ways of communicating "energy":

① Thermochemical equation:

energy is written part of the equation:

Endo Reactant(s) + energy → Products

Exo or Reactants → Products + energy

② ΔH is written beside the equation:

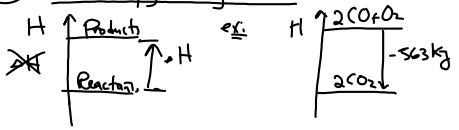
Ex: $\frac{1}{2}NaOH_{(aq)} + \frac{1}{2}HCl_{(aq)} \rightarrow H_2O_{(l)} + NaCl_{(aq)}$ $\Delta H = -58\,kJ$ as written

$\Delta H_{NaOH} = -58\,kJ/mol$ $\Delta H_{HCl} = -58\,kJ/mol$

Ex: $2CO_{(g)} + O_{2(g)} \rightarrow 2CO_{2(g)}$ $\Delta H = -563\,kJ$

$\Delta H_{CO} = \frac{-563}{2} = -281.5\,kJ/mol$

③ Enthalpy diagram:



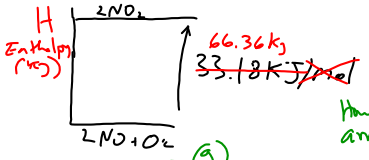
④ Statement of molar enthalpy (usually it's at SATP) ΔH° or ΔH

Ex: $\Delta H^\circ_{Respiration} = -2802.7\,kJ/mol\ glucose$

✓ $2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O + 5742\,kJ$

$1C_4H_{10} + \frac{13}{2}O_2 \rightarrow 4CO_2 + 5H_2O + 2871\,kJ$

$2SO_2 + O_2 \rightarrow 2SO_3$ $\Delta H = -198\,kJ$



(g)

How much oxygen is required to completely burn 55 g of propane C_3H_8 and how much energy is released knowing $\Delta H_{Comb\ propane} = -2219\ kJ/mol$

Need: a balanced thermochemical equation:

$1C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O + 2219\,kJ$

Mass: 55 g m_{O_2}?

Molar mass: 44.09 g/mol 32.00 g/mol

mol	1.25	x (6.25 mol)	x kg
mole Ratio	1	5	$6.25\,mol \times 32.00\,\frac{g}{mol}$

$x = \frac{5 \times 1.25}{1} = 6.25$ $= 20 \times 10^2\,g$

$\frac{5O_2}{6.25\,O_2} = \frac{-2219\,kJ}{x}$ or $\frac{C_3H_8}{1.25} = \frac{-2219}{x}$

$x = -2773.75\,kJ$

$= -2.8 \times 10^3\,kJ$ or $-2800\,kJ$

Feb 9-12:12 PM